

# User manual

## **1. Summary**

### **1.1 Functions**

Frequency band: 2405 ~ 2480MHz.

FSK or GFSK modulation

Low current consumption: RX 16mA, TX 20mA (at 0dBm output power).

Low sleep current (1.5 uA).

On chip regulator, support input voltage 2.0 ~ 3.6 V.

Programmable data rate from 2Kbps to 500Kbps.

Programmable TX power level from – 20 dBm to 1 dBm.

Ultra High sensitivity:

-95dBm at 500Kbps on-air data rate.

-97dBm at 250Kbps on-air data rate

-104dBm at 25Kbps on-air data rate

-107dBm at 2Kbps on-air data rate

Easy to use.

Support 3-wire or 4-wire SPI.

ONE register setting for new channel frequency.

8-bits Digital RSSI for clear channel indication.

Fast exchange mode during TRX role switching.

Auto RSSI measurement.

Auto Calibrations.

Auto IF function.

Auto CRC Check.

### **1.2 Application**

The module is built in a remote controller. The remote controller used to control household electric bed products.

## 2. Electrical characters

Item	Description	Remark
1	EUT name	HJRF
2	EUT function	2.4GHz Wireless Module
3	Operation frequency	2405MHz ~ 2480MHz
4	Modulation Technology	FSK or GFSK
5	Manufacturer	Richmat
6	Supply voltage	2.0-3.6V
7	Current consumption	1.5uA(RC OSC OFF, typical) @Sleep mode 0.3uA(RC OSC ON, typical) @Idle mode 1.9mA(typical) @Standby mode 9mA(typical) @PLL mode 16mA(typical) @RX mode 20mA(typical) @TX mode
8	Transmit output power	0 dBm
9	Rx sensitivity	-95 dBm Data rate 500K -97 dBm Data rate 250K -104 dBm Data rate 25K -107 dBm Data rate 2K
10	Interface	6 pin 2mm header
11	Dimension	23 * 12.5 (mm)
12	Operation Temperature	-40 ~ 85°C

### 3. Absolute Maximum Ratings

Parameter	With respect to	Rating	Unit
Supply voltage range (VDD)	GND	-0.3 ~ 3.6	V
Digital IO pin range	GND	-0.3 ~ VDD+0.3	V
Voltage on the analog pins range	GND	-0.3 ~ 2.1	V
Input RF level		5	dBm
Storage temperature range		-55 ~ 125	°C
ESD rating	HBM	±2K	V
MM		±100	V

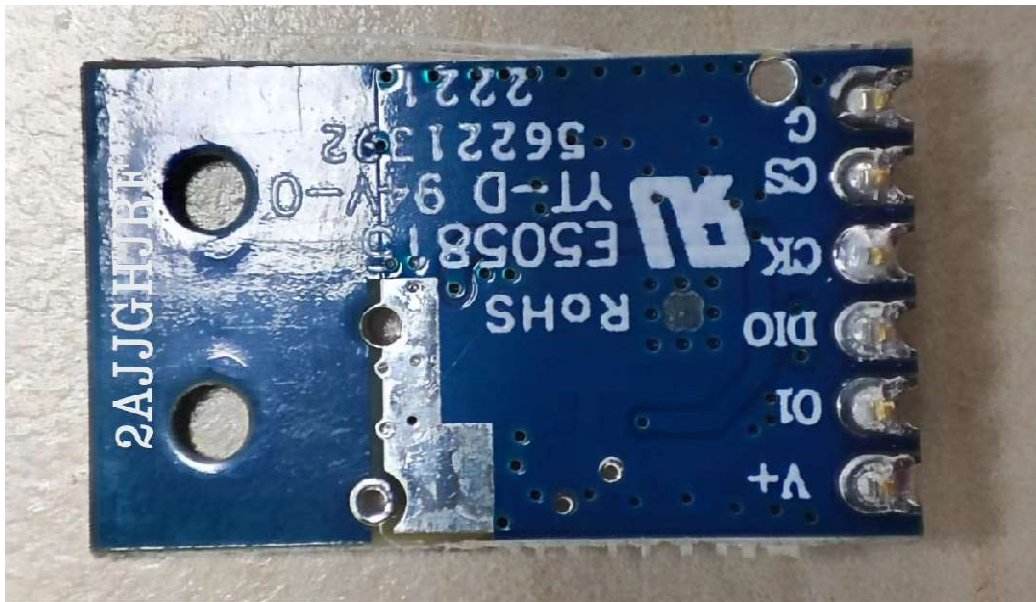
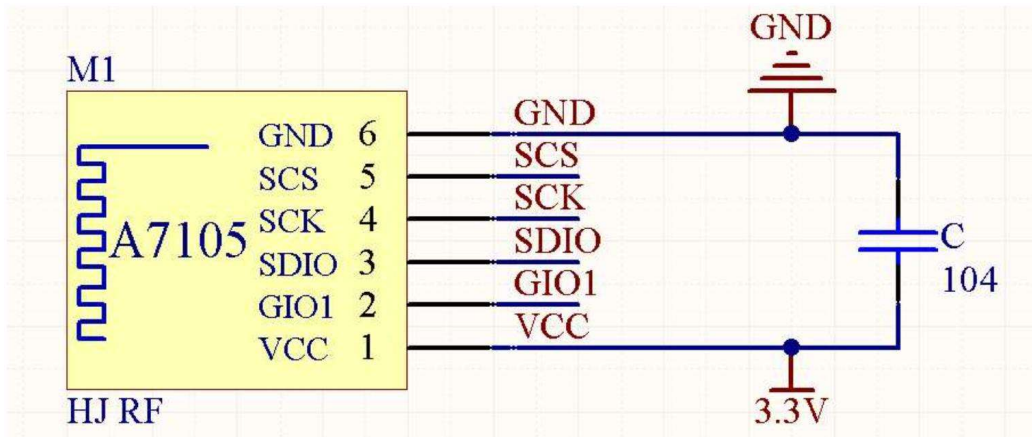
\*Stresses above those listed under “Absolute Maximum Rating” may cause permanent damage to the device. These are stress ratings only; functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

\*Device is ESD sensitive. Use appropriate ESD precautions. HBM (Human Body Mode) is tested under MIL-STD-883F Method 3015.7. MM (Machine Mode) is tested under JEDEC EIA/JESD22-A115-A.

\*Device is Moisture Sensitivity Level III (MSL 3)

## 4. Pin assignment

### 4.1 Pin distribution



### 4.2 Pin definition

Pin No.	Symbol	Function description
6	GND	Ground
5	SCS	3 wire SPI chip select
4	SCK	3 wire SPI clock input pin
3	SDIO	3 wire SPI read/writer data pin
2	GIO1	Multi-function GIO1/4-wire SPI data output
1	VCC	PF module supply voltage input

## **5. Installation instructions**

This module can only be used when installed on host.

This module should be welded on the PCB of host by professional person with professional tools. It is not approved for any party to change or modify the host, if without the manufacturer's permission.

## 6. Warning

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Caution: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### Information for the OEM integrators

This device is intended for OEM integrators only. Please see the full grant of equipment document for restrictions.

### Label information to the end user by the OEM integrators

If this certified module is installed inside the hose device, then the outside of the host must be labelled with "Contains FCC ID: 2AJJGHJRF".

## **7. The requirement for KDB 996369 D03:**

### **7.1 List of applicable FCC rules**

FCC Part 15. 249.

### **7.2 Summarize the specific operational use conditions**

None

### **7.3 Limited module procedures**

The Module is limited to manufacturer's host devices only.

### **7.4 Trace antenna designs**

The module uses the permanent PCB antenna, so this requirement is not applicable to the product.

### **7.5 RF exposure considerations**

The host device manufacturer confirms that a separation distance of 5mm or less between the antenna of this host device and persons during the host device operation.

### **7.6 Antennas**

PCB antenna, 0dBi

### **7.7 Label and compliance information**

If this certified module is installed inside the host device, then the outside of the host must be labeled with "Contains FCC ID: 2AJJGHJRF".

### **7.8 Information on test modes and additional testing requirements**

The host manufacturer can use the software to make RF transmit continuously.

### **7.9 Additional testing, Part 15 Subpart B disclaimer**

The module only complies with the FCC Part 15.249. If the module is installed in the host device, the host manufacturer is responsible for the compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. For example, if the host manufacturer markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the host manufacturer shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

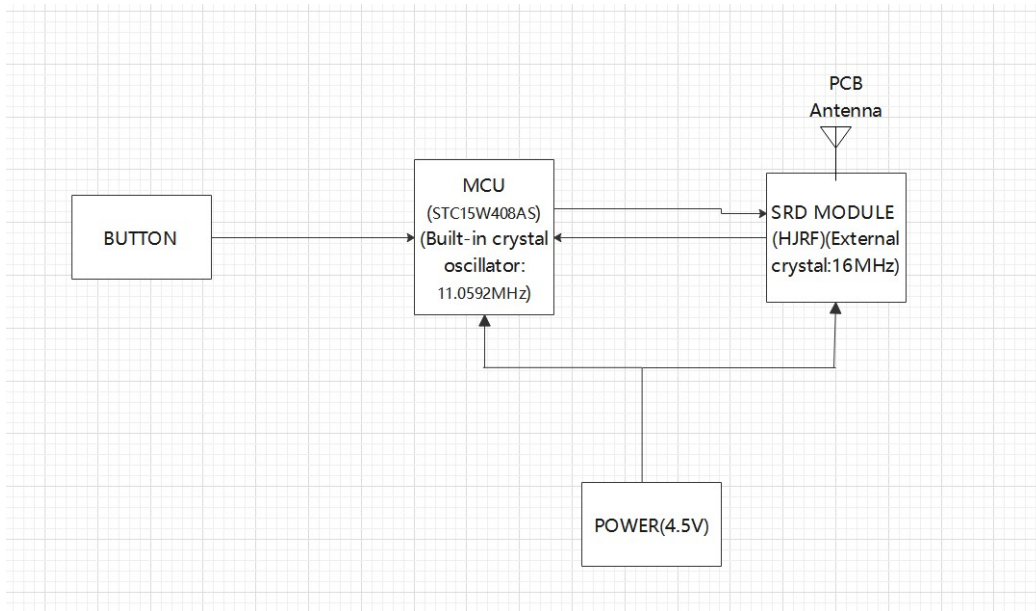


## 8. HOST HJSR79

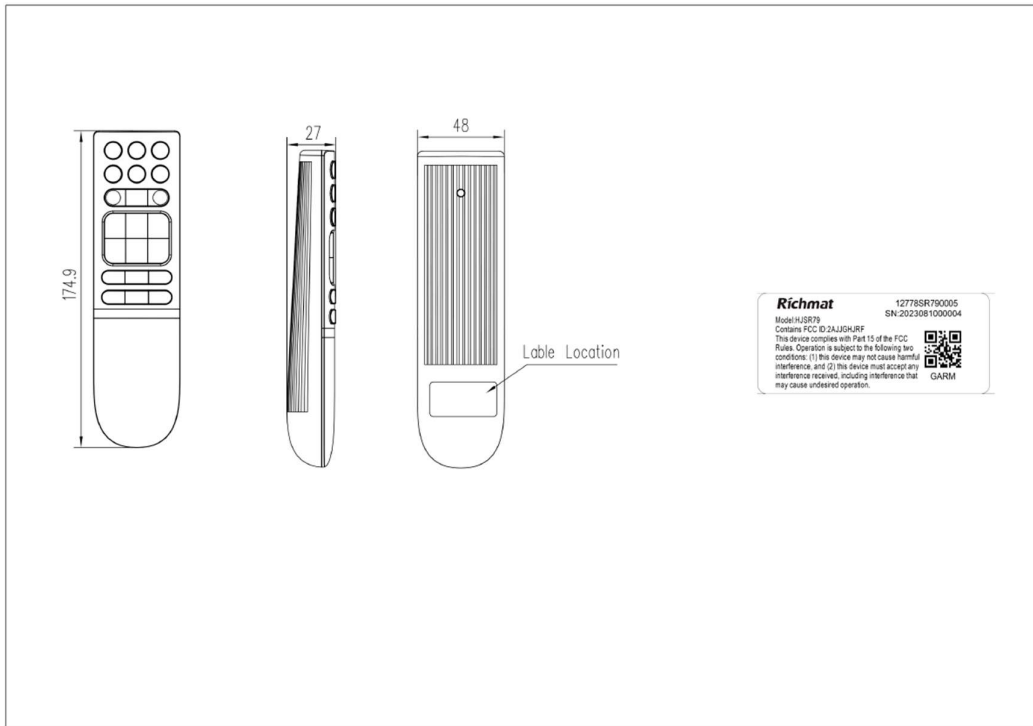
### 8.1 Host description:

The HJSR79 remote control is mainly used for the control of household electric bed products to realize wireless control of the motor, indoor and portable use.

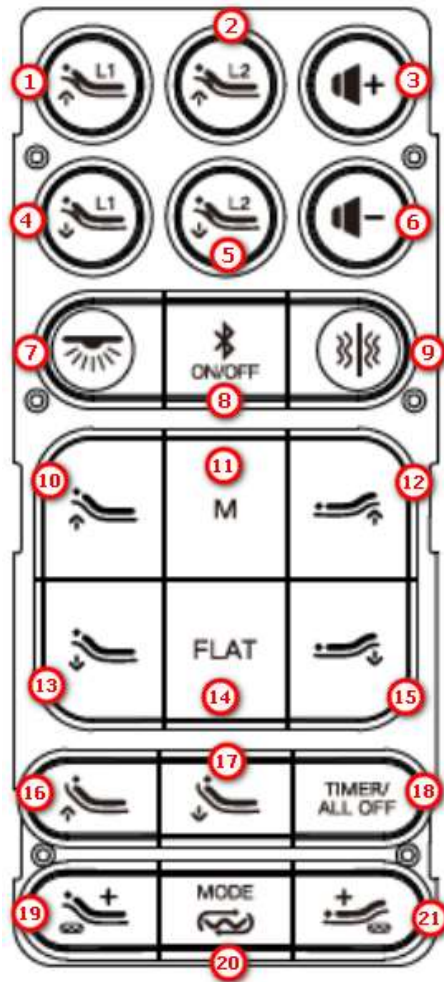
The remote control has only a built-in low-power SRD module HJ RF, crystal frequency 16MHz, working frequency range: 2.405-2.48GHz, modulation method GFSK, PCB antenna, gain 0dBi. Built-in DC-DC step-down circuit, low standby power consumption, can easily realize the wireless control of the product.



## 8.2 Host overview:



### 8.3 Remote control key diagram:



Fixed position (external support to participate in memory, first move the head and foot, then move the external support)

Power-on reset	Yes	Alignment line	Align the code and reset	
Fixed position (mm)	ZG	SNORE	L	TV
Head	43	26	128	199
Foot	83	0	54	75

#### 8.4 Remote control function description:

(Motor sequence: head - foot - external support 1 - external support 2 - external support 3 near the power port)

Key label	Feature
1	External drag 2 (waist 1) rise, release stop (4th way)
2	External drag 3 (waist 2) rise, release stop (5th way)
3	In the music follow-up mode, press this button to increase the speaker volume, a total of 15 gears, the highest after the 15 gears, sound prompt "Maximum volume" vibration intensity is not affected
4	Drag 2 (waist 1) down, release stop (4th way)
5	Drag 3 (waist 2) down, release stop (5th way)
6	In the music follow-up mode, press this button to reduce the speaker Volume. After setting the tone to the lowest setting, the sound prompts "Min Volume", and the vibration intensity is not affected
7	Under the bed light on/off (default 5 minutes off), remote control off, induction light is not good
8	<p>Bluetooth switch: When the device is powered on and Bluetooth is off, the Bluetooth device cannot be searched, and the button in the music follow-up operation area does not respond</p> <p>Press this button, the Bluetooth function will be turned on, and the audio prompt "Bluetooth on, please wait" will be displayed. At this time, the Bluetooth device (ZYKJ_XXXXX) can be found and connected. After successful connection, the audio prompt "bluetooth connected" will be displayed and music will be played. When powering on for the first time, the vibrator performs music follow-up operation at the default 2 levels of intensity (if the vibration intensity has been manually adjusted, it vibrates according to the adjusted intensity)</p> <p>Press the button again, the Bluetooth function is turned off, and the sound prompts "Bluetooth off".</p>
9	Follow-up enhancement: In the music follow-up mode, press this button to increase the vibration intensity of the follow-up, and cycle according to 0-1-2-3 gear (enter the music follow-up mode, default 2 gear) (audio real-time broadcast status :massager off/massager low /massager medium/massager high)
10	Back up, release to stop
11	The motor runs to M1 position with one click (no initial value).

	Multiplexing function: FLAT+M1, backlight flashing, buzzer ringing, record current motor position to M1. (Power off does not clear)
12	Feet up, release to stop
13	Back down, release to stop
14	One-click reset: All motors run to the horizontal position with one click
15	Foot down, release to stop
16	Drag one (neck) up, release to stop (third way)
17	Drag one (neck) down, release stop (third way)
18	Reuse function key: Before pressing the key, if the massager is in working state, all the massagers will be turned off after pressing the key, and the working time of the next massage motor will be set for 10min, 20min,30min respectively (audio broadcast: massager off). The timing time is displayed through two indicators. If the massager is not in working state, the working time of the massage motor is directly fixed for the next time
19	Head massager enhancement: Press the button, if the head massager does not start, start the head massager and enter "CONSTANT" mode; If the head massage motor is started, increase the vibrational intensity of the massager,1 →2→3→ off, cycle switch (default 30 minutes off) Intensity 1,10 minutes light red, intensity 2, 20 minutes light green, intensity 3, two lights together bright blue. (Intensity status audio broadcast: massager off/massager low /massager medium/massager high)
20	Mode switching --CONSTANT-PULSE-WAVE Massage motor mode adjustment, after the massager has been started, press this button, the working massage motor will enter the "PULSE" mode, press the button again, the massage motor will enter the "WAVE" mode, press the button again, the massage motor will enter the "CONSTANT" mode, and then cycle. One CONSTANT buzzer, two PULSE buzzers, three WAVE buzzers, Also display the current intensity color (audio real-time broadcast status: broadcast after the massager is turned on massager mode one/ massager mode two/massager mode three)
21	Foot massager enhancement: Press the button, if the foot massager does not start, start the foot massager and enter "CONSTANT" mode; If the foot massage motor is started, increase the vibration intensity of the massager, 1→2→3→ off, and cycle switch (default 30 minutes off). Intensity 1,10 minutes light red, intensity 2,20 minutes light green, intensity 3, two lights together light blue.
Coding method: [Remote control head rise + foot rise + control box code key] Buzzer sounds, indicating successful code *The control box has a reset function for code keys * The control box is powered on and reset, and all motors are reset. The reset process cannot be interrupted by any key. (During power-on reset, reset the head and foot first, and reset the other three ways later)	

Smart Set Lock (After unlocking the lock in the APP, the following functions are available \*\*\*)

- 1、 When the user is in bed, the control box controls the operation of each motor to the Smart Position (leisure position). At this time, the remote control and APP can be operated directly
- 2、 When the user leaves the bed, the sleep detection belt detects that when the user is not in bed for more than 10 minutes, the remote control and APP are locked and cannot be operated. The remote control needs to be unlocked to operate. The APP can operate only after the Smart Set Lock is disabled. APP and remote control only need to unlock one of them, and the other one will unlock automatically (after the remote control is unlocked, the APP display is not synchronized).  
(Remote control lock: remote control waist 1 L + waist 2 L, buzzer sounds, indicating unlocking)  
Note: After the lock, use the remote control or APP to control the control box buzzer will ring, indicating that it has been locked, and can not be controlled at this time.
- 3、 Sleep aid: the mobile APP connects to the Bluetooth speaker to play white noise sleep aid music, detects that the user is falling asleep, automatically suspends the music play and executes the FLAT command on the bed.

Anti-snoring function:

When someone is asleep in bed,

When the first snoring is received, the next snoring is received within a minute, and the motor slowly runs to the preset position. After the snoring intervention, the timer starts. If no snoring occurs within 5 minutes, the bed should be placed flat. If the judgment condition is triggered within 5 minutes, reset the time and restart the timing intermittently: after the snoring intervention, the timing will start. If the judgment condition is not triggered within 1 hour, the work will be judged as finished and the work will start again.

Note:

To protect the reliability and safety of the motor and control box, do not switch keys frequently.

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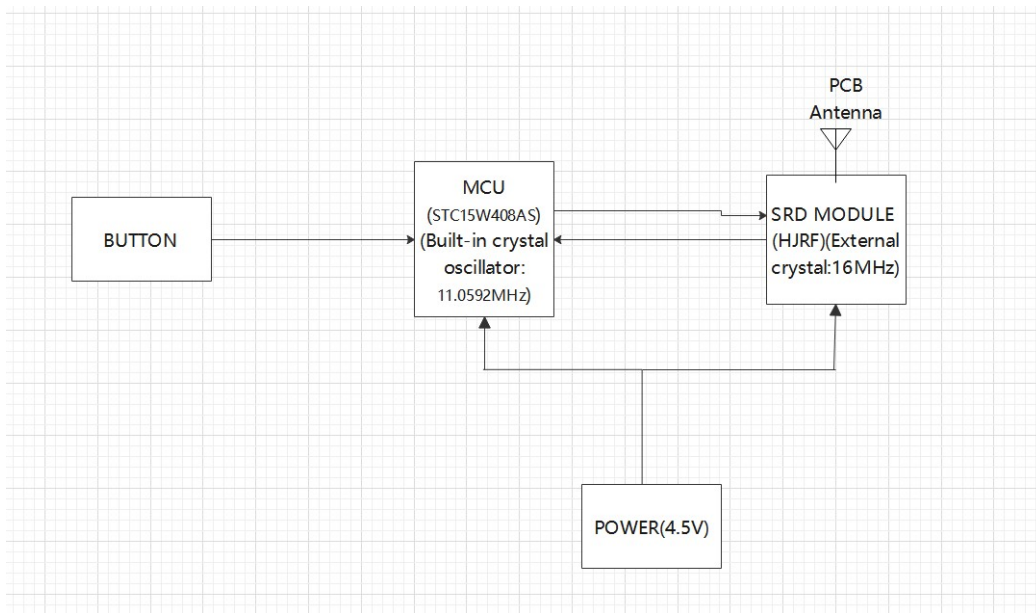
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
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- Consult the dealer or an experienced radio/TV technician for help.

## 9. HOST HJSR79B

### 9.1 Host description:

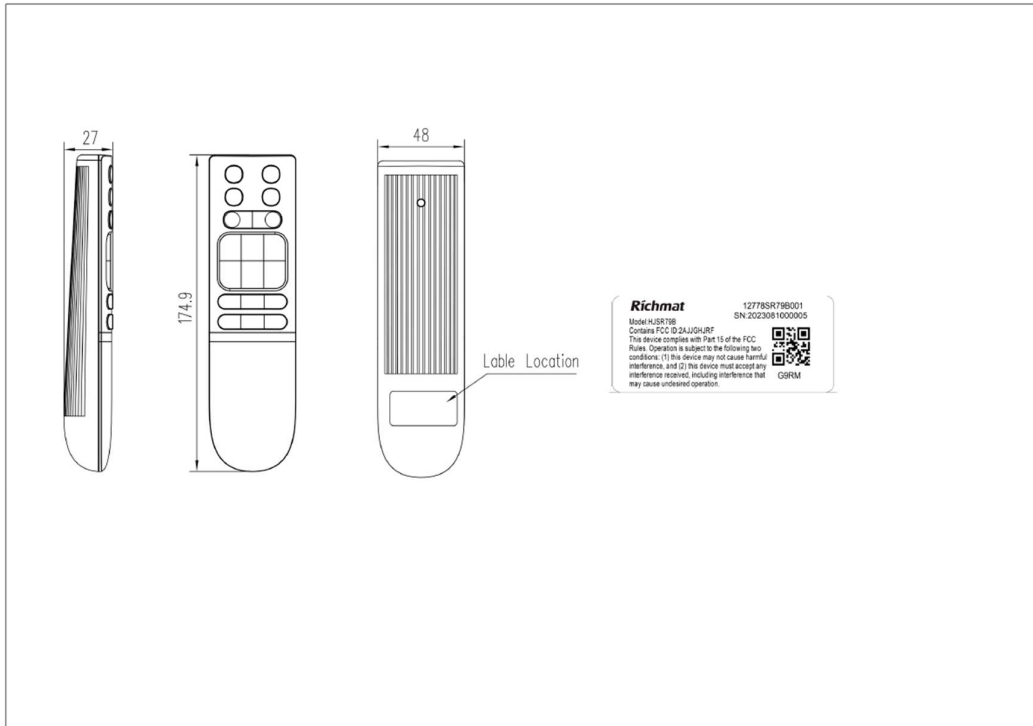
The HJSR79B remote control is mainly used for the control of household electric bed products to realize wireless control of the motor, indoor and portable use.

The remote control has only a built-in low-power SRD module HJ RF, crystal frequency 16MHz, working frequency range: 2.405-2.48GHz, modulation method GFSK, PCB antenna, gain 0dBi. Built-in DC-DC step-down circuit, low standby power consumption, can easily realize the wireless control of the product.





## 9.2 Host overview:



### 9.3 Remote control key diagram:



#### 9.4 Remote control function description:

Key label	Feature
1	Short press to release run to TV position (with initial value). Multiplexing function: (FLAT+TV), backlight flashing, buzzer sound, record the current motor position to the TV position. (Power off to clear).
2	Short press to release the run to the LOUNGE position (with initial value). Reuse function: (FLAT+LOUNGE), backlight flashes, buzzer sounds, record the current motor position to the LOUNGE position. (Power off to clear).
3	Short press release runs to SNORE position (with initial value). Multiplex function: (FLAT+SNORE), backlight flashes, buzzer sounds, record current motor position to SNORE position. (Power off to clear).
4	Short press release run to ZG position (with initial value). Multiplexing function: (FLAT+ZG), backlight flashing, buzzer ringing, record the current motor position to the ZG position. (Power off to clear).
5	Back motor, foot motor out at the same time, release to stop.
6	Back motor, foot motor retract at the same time, release stop.
7	Back motor extended, release to stop
8	Short press release runs to M1 position (no initial value). Multiplexing function: (FLAT+M1), backlight flashing, buzzer ringing, record current motor position to M1 position. (Power off does not clear)
9	Foot motor out, release to stop
10	Back motor retracts, release to stop
11	One-button reset, all motors retracted to the minimum stroke position, power-on reset
12	Foot motor retracts, release to stop
13	Head massager enhanced, massager can be opened (30 minutes from Move off) (1→2→3→ close cycle switch), and display the current massage time
14	Underbed light on/off (default: 15 minutes off)
15	Foot massager enhanced, massager can be opened (30 minutes from Move off) (1→2→3→ close cycle switch), and display the current massage time
16	Mode switch --CONSTANT-PULSE-WAVE(display current working time of massager)
17	Press the flashlight to turn on, release the flashlight to turn off
18	Massager off. The working time of the massager is set to 10min, 20min, 30min respectively, and the timing time is displayed by two indicators
Coding method: [Remote control head rise + foot rise + control box code key] Buzzer sounds, indicating successful code * The control box has a reset function for the code key * The control box is powered on and reset, all motors are reset at the same time, and the reset process cannot be interrupted by any key	

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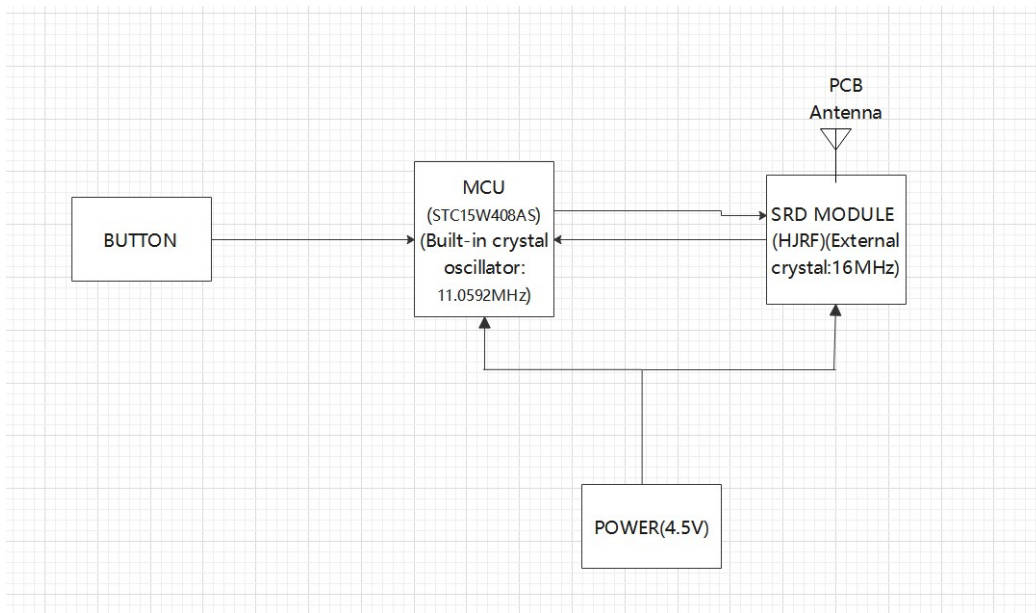
- Reorient or relocate the receiving antenna.
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## 10.HOST HJSR79C

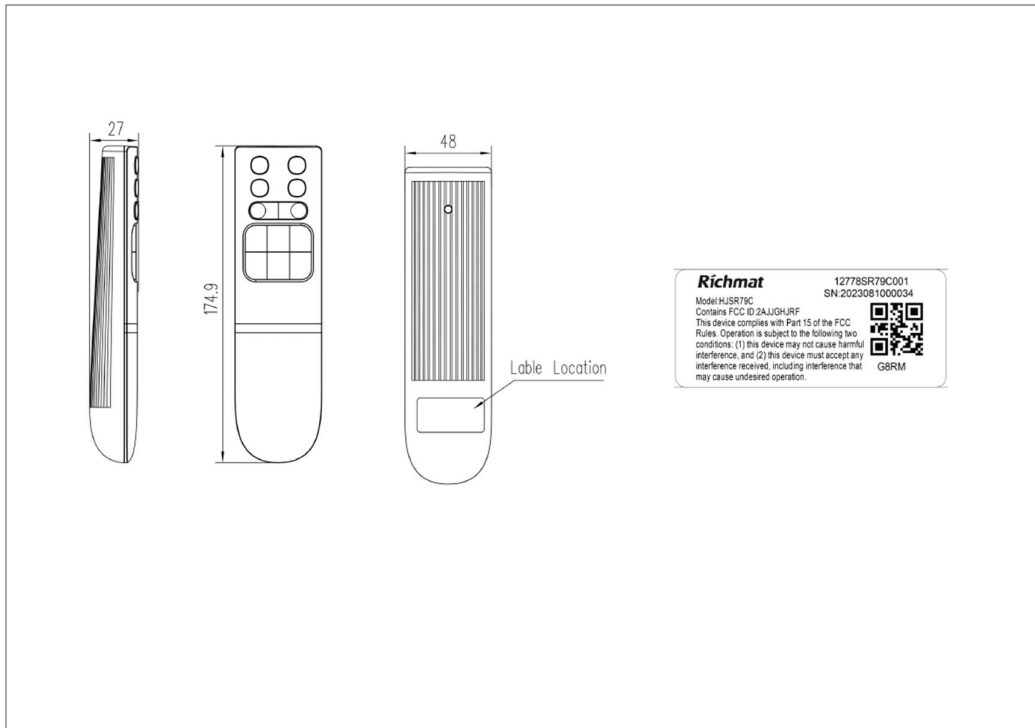
### 10.1 Host description:

The HJSR79C remote control is mainly used for the control of household electric bed products to realize wireless control of the motor, indoor and portable use.

The remote control has only a built-in low-power SRD module HJ RF, crystal frequency 16MHz, working frequency range: 2.405-2.48GHz, modulation method GFSK, PCB antenna, gain 0dBi. Built-in DC-DC step-down circuit, low standby power consumption, can easily realize the wireless control of the product.



## 10.2 Host overview:



10.3 Remote control key diagram:



#### 10.4 Remote control function description:

Key label	Feature
1	Run to TV position with one click (with initial value). Multiplexing function: FLAT+TV, backlight flashing, buzzer ringing, record the current motor position to the TV position. (Power off to clear, restore the initial value)
2	One-click to the LOUNGE location (with initial value). Reuse function: FLAT+LOUNGE, backlight flashing, buzzer ringing, record the current motor position to the LOUNGE position. (Power off to clear, restore the initial value)
3	One-click run to SNORE location (with initial value). Multiplexing function: FLAT+SNORE, backlight flashing, buzzer ringing, record current motor position to SNORE position. (Power off to clear, restore the initial value)
4	One-click run to ZG position (with initial value). Multiplexing function: FLAT+ZG, backlight flashing, buzzer ringing, record the current motor position to the ZG position. (Power off to clear, restore the initial value)
5	Back, leg motor out, release stop
6	Back, leg motor retract, release stop
7	Back motor extended, release to stop
8	One-click run to M1 mode position (no initial value). Multiplexing function: FLAT+M1, backlight flashing, buzzer ringing, record current motor position to M1. (Power off does not clear)
9	Foot motor out, release to stop
10	Back motor retracts, release to stop
11	One-button reset, all motors retracted to the minimum stroke position, power on and reset
12	Foot motor retracts, release to stop
Coding method: [Remote control head rise + foot rise + control box code key] Buzzer sounds, indicating successful code. * The control box has a reset function for the code key * The control box is powered on and reset. The reset process cannot be interrupted by any key	



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